

LED AND LASER DIODE CHARACTERISTIC APPARATUS

OBJECTIVE

To Study I-V characteristics of LED and Diode Laser. To Study P-I characteristics of LED and Diode Laser.

A **light-emitting diode (LED)** is a semiconductor light source. Like a normal diode, the LED consists of a chip of semiconducting material doped with impurities to create a *p-n junction*. As in other diodes, current flows easily from the p-side, or anode, to the n-side, or cathode, but not in the reverse direction. Charge-carriers—electrons and holes—flow into the junction from electrodes with different voltages. When an electron meets a hole, it falls into a lower energy level, and releases energy in the form of a photon. The wavelength of the light emitted, and therefore its color, depends on the band gap energy of the materials forming the *p-n junction*. Typical I-V Characteristics of LED in forward bias are shown in the fig.

A **laser diode** is a laser where the active medium is a semiconductor similar to that found in a light-emitting diode. A laser diode, like many other semiconductor devices, is formed by doping a very thin layer on the surface of a crystal wafer. The crystal is doped to produce an n-type region and a p-type region, one above the other, resulting in a *p-n junction*, or diode.

PROCEDURE: LEDs are connected in forward bias arrangement and applied voltage across LED is varied & corresponding current is measured. Result is tabulated and plotted on the graph. In second part voltage applied across Laser diode is varied and it's corresponding output is measured & plotted.

INSTRUMENT

The setup consists of Main Unit having variable power supply, digital voltmeter, digital milliammeter, LEDs (4 nos), Diode Laser with holder, photo detector, bases.

Manufacturers:



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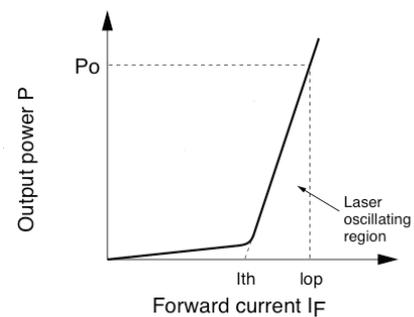
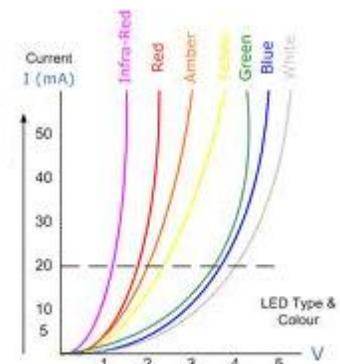
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Output power vs. Forward current (P-I_F)